

EFFECTS OF FOUR COMMERCIALY AVAILABLE DISINFECTANTS ON GROWTH TRAITS AND PROXIMATE ANALYSIS OF MEAT OF BROILER CHICKENS

Aleem-ur-Rashid Farooqi, Shakil Akhtar Khan,
Ahmad Raza (Late), Muhammad Naeem and Hameed Ahmad¹
College of Veterinary Sciences, ¹PCSIR Laboratories, Lahore, Pakistan

ABSTRACT

For this study, 125 one-day-old broiler chicks were procured from the local market. They were divided into five groups A, B, C, D and E and all groups were reared upto 45 days separately in different cages. All groups were provided with feed and water *ad libitum* and vaccinated. Disinfectants used to spray in the presence of birds of groups A, B, C and D were TH₄, Prophyl, Beloran and Fourtedes, respectively. Group E was kept as control. The disinfectants were sprayed once a week, starting from 1st week to 5th week of experiment, as per recommended doses. The average weight gain, feed consumed and feed conversion ratio (FCR) for all groups was determined on 15th, 30th and 45th day of the experiment. The proximate analysis of meat (pH, moisture, protein, fat and ash) of 5 birds of each group was conducted at the end of experiment. The mean values of weight gain by the birds of experimental groups were more than the mean values of the control on 45th day. Statistical analysis showed that experimental groups B, C, and D had significant difference ($P < 0.05$) from control group E, but group A had non-significant difference from the control. FCR of all treated groups was better than the control. All groups had significant difference ($P < 0.05$) from the control except group A. Proximate analysis of meat revealed that there was non-significant difference among the control and treated groups.

INTRODUCTION

Poultry farmers and practitioners are confronting a major problem in controlling outbreaks of infectious diseases due to contaminated surroundings of the flock, in spite of using high doses of antibiotics. So it is imperative to sanitize the whole poultry shed in the presence of birds for prevention of the devastating diseases. But this important task can only be accomplished by the use of highly effective and innocuous disinfectants. Keeping in view the dire need of ideal disinfectants for poultry farmers, this project was designed to compare efficacy and safety of four commercially available disinfectants including TH₄ (SOGEVAL, France), Fourtedes (Alverta GmbH, Germany), Prophyl (Meril Laboratories, France) and Beloran (Ciba Giegy, Switzerland).

MATERIALS AND METHODS

For this study 125 one-day-old broiler chicks were procured from the local market. They were divided into five equal groups i.e., A, B, C, D and E and all groups were reared upto 45 days separately in different sheds. All groups were provided with feed and water and *ad*

libitum vaccinated. Disinfectants used for spray in the presence of birds of groups A, B, C and D were TH₄, Prophyl, Beloran and Fourtedes, respectively. Group E was kept as control. The disinfectants were sprayed once a week, starting from 1st to 5th week of experiment using the recommended doses.

The average weight gain, feed consumption and feed conversion ratio (FCR) for each experimental and control group was determined on 15th, 30th and 45th day of the experiment. The proximate analysis of meat (pH, moisture, protein, fat and ash) of birds of each group was conducted at the end of experiment by adopting the AOAC methods (Richard, 1984).

The data of all groups were compared by analysis of variance and statistical difference among various treatment means were determined by using LSD (Steel and Torrie, 1980).

RESULTS

Weight gain by the experimental groups was better than the control. Statistical analysis showed that the mean values of weight of experimental group B, C and D were significantly different ($P < 0.05$) from the mean

value of control (Table 1).

Feed consumption of the experimental groups was better than the control except of group A. Statistical analysis showed that at the end of experiment, groups A and B were non-significantly whereas groups C and D were significantly ($P < 0.05$) different from control (Table 1).

Feed conversion ratio (FCR) of the experimental groups was better than the control, except group A. Statistical analysis of FCR at the end of experiment revealed significantly ($P < 0.05$) better FCR in groups B, C and D than group A and control (Table 1).

The four disinfectants had no deleterious effect on the proximate analysis of meat as all parameters (pH, moisture, protein, fat and ash) had non-significant difference among experimental groups and control (Table 2).

DISCUSSION

This project was conducted to study effects of four commercially available disinfectants (TH₄, Prophyl, Beloran and Fourtedes) on growth and proximate analysis of meat of broiler chickens. At the end of the experiment on 45th day, the mean values of weight gain by the birds of experimental groups were more than the mean value of control. Ely (1951) found that certain surfactant produced an increased growth response in chicks. Ely and Schott (1952) tested seven synthetic detergents for chicks growth. Of these products, one showed no effect on growth, two gave a minor growth improvement and four were rather active growth stimulators. Lillie *et al.* (1958) tested some blends of quaternary compounds (QAC) and found an improved growth response. The results of our study are quite similar

Table 1: Effect of disinfectants on weight gain, feed consumption and feed conversion ratio (FCR) in broiler chickens

Age (days)	Treatments (Mean \pm SD)				
	A(TH ₄)	B(Prophyl)	C(Beloran)	D(Fourtedes)	E(Control)
Weight gain					
15	283.4 \pm 16.1bc	293.6 \pm 21.0bc	305.8 \pm 11.0ab	319.8 \pm 16.8a	280.2 \pm 14.9c
30	958.0 \pm 55.0	938.0 \pm 73.0	1002.2 \pm 27.3	977.6 \pm 87.6	895.0 \pm 56.9
45	1761.2 \pm 57.1c	1839.8 \pm 61.5bc	1957.6 \pm 68.5a	1910.0 \pm 93.0ab	1753.0 \pm 89.4c
Feed consumption					
15	408.0 \pm 5.8	414.0 \pm 22.7	426.0 \pm 23.0	430.0 \pm 20.8	423.0 \pm 23.1
30	1688.0 \pm 28.6ac	1683.0 \pm 42.6bc	1718.0 \pm 21.3a	1715.0 \pm 16.0ab	1662.0 \pm 56.4c
45	3939.0 \pm 121.3b	3963.0 \pm 120.0b	4274.4 \pm 61.5a	4143.0 \pm 167.0a	3961.0 \pm 137.2b
FCR					
15	1.45 \pm 0.1	1.41 \pm 0.1	1.39 \pm 0.1	1.34 \pm 0.1	1.5 \pm 0.1
30	1.76 \pm 0.1	1.79 \pm 0.2	1.78 \pm 0.2	1.75 \pm 0.2	1.82 \pm 0.10
45	2.23 \pm 0.03a	2.15 \pm 0.04b	2.16 \pm 0.05b	2.17 \pm 0.06b	2.25 \pm 0.04a

Values with different letters in a row differ significantly ($P < 0.05$).

Table 2: Mean \pm SD values of analysis of meat of broiler chickens in treated with different disinfectants and control group.

Group	Treatment	pH	Moisture (%)	Protein (%)	Fat (%)	Ash (%)
A	TH ₄	5.81 \pm 0.11	69.38 \pm 3.38	23.17 \pm 3.31	7.01 \pm 0.48	1.16 \pm 0.15
B	Prophyl	6.11 \pm 0.47	72.90 \pm 2.96	20.90 \pm 2.31	7.73 \pm 1.18	1.03 \pm 0.15
C	Beloran	5.98 \pm 0.20	72.66 \pm 5.21	22.53 \pm 2.78	6.23 \pm 1.22	1.18 \pm 0.12
D	Fourtedes	5.67 \pm 0.27	72.83 \pm 1.91	21.36 \pm 1.66	8.18 \pm 1.83	1.10 \pm 0.13
E	Control	5.95 \pm 0.28	71.45 \pm 1.88	24.73 \pm 1.41	8.48 \pm 0.68	1.00 \pm 0.08

with the findings of above workers. The more weight gain of birds of all experimental group than the control birds may be due to providing hygienic environment which may act as a conducive factor for rapid growth. The considerable variability in stimulating effects of four disinfectants might be due to the different percentage and type of their contents.

At the end of experiment the mean values of feed conversion ratio (FCR) of experimental groups were better than the control. Among experimental groups the poorest FCR was shown by the birds of group A. Almquist and Merritt (1955) presented data to show that 4 alkyl quaternary ammonium derivatives consistently improved efficiency of feed utilization. Lillie *et al.* (1958) reported that FCR was improved by 4 of the 5 surfactant, namely nonyl phenoxy ethoxy carbo-methyl dimethyl benzyl ammonium chloride, refined tallow soap, primarily sodium stearate, glycerol monostearate, procaine penicillin and sodium sulfate. The results of our study are quite similar with the findings of above workers. Better FCR in treated groups could be indicative that the spray of disinfectants provided a hygienic environment, creating less stress on the birds, which improved the FCR. The reasonable difference of the mean value of FCR of experimental group A from the values of other experimental groups may be due to variable nature and mode of action of active ingredients of different disinfectants.

The mean values of proximate analysis of meat of chickens were non-significantly different among groups. Cunningham and Lawrence (1977) studied the effect of chlorinated compound on poultry meat and reported small amount of chlorinated lipids and water soluble chlorinated compounds in meat. Bala *et al.* (1977) reported the effect of spray sanitation in stability of prepackaged fresh beef and found that acetic acid spray sanitation did not adversely affect color desirability. Ruiter (1985) described that proper use of disinfectant (quaternary ammonium compounds) in meat industry did not introduce any toxicological problem.

The results of proximate analysis of meat of birds in our study showed that the level of metabolic

activities of all birds were nearly the same irrespective the sheds of birds sprayed in the presence of flock or not. It can be summarized that four disinfectants (TH₄, Prophyll, Beloran and Fourtedes) have no harmful effect on metabolism of broiler chickens and also on biochemical composition and nutritive value of meat.

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